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JAPAN'S DEFENSE INDUSTRY

Summary

Japan's defense industry has been constrained over the years by a relatively limited defense budget and a ban on weapons exports. In the past these factors tended to make Japan's advanced armaments not only more expensive but inferior to their U.S.-made counterparts. The Japanese defense sector's growing success in applying leading-edge civilian technologies to military purposes, however, has helped change this situation, as has development of qualitatively improved systems. Recognizing these breakthroughs, the United States has tried to draw from Japan's well of high technology since concluding a 1983 agreement governing defense technology transfers.

Japan's emergence as the world's third-largest military spender behind the Soviet Union and the United States has raised questions in some U.S. quarters concerning the implications of this buildup for Japan's defense industry. Tokyo's proposed 1991-95 defense plan indicates that the Japan Defense Agency will continue to purchase some sophisticated systems from U.S. arms makers. But, due in part to the controversy over joint development of Japan's new fighter aircraft, FSX, Tokyo increasingly may favor the development of indigenous defense technology.

This likely shift will not be accompanied by an end to the ban on exports of military hardware. Japanese industry, however, can be expected to pose increasingly stiff competition in global markets for dual-use technologies. In terms of military hardware Japan's prime contractors may experience a flattening of growth due to anticipated smaller increases in defense spending and the attainment of some major equipment procurement goals. But

systems upgrades, involving electronic and other improvements, will be a boon to subcontractors.

Market Limitations

Japan's war-renouncing constitution and emphasis on maintaining strictly a self-defense capability have served to limit government spending on defense to around 1 percent of gross national product for most of the postwar period (see Table 1). Pacifist sentiments in Japan are still so strong that efforts to greatly exceed or even scrap the de facto ceiling -- established in 1976 by then Prime Minister Takeo Miki -- have provoked public outcry. Japan's commitment to permanent peace also is reflected in its 1967 policy banning weapons exports to communist countries, countries under United Nations sanctions and countries involved in or threatening to become involved in conflicts.

Table 1: Japan's Defense Budget, FY 1955-FY 1990

(in billions of yen)

Fiscal Year	Initial Budget	Percent Change	Ratio to GNP
1955	Y134.9	-3.3%	1.78
1965	301.4	9.6	1.07
1975	1,327.3	21.4	0.84
1980	2,230.2	6.5	0.90
1981	2,400.0	7.6	0.91
1982	2,586.1	7.8	0.93
1983	2,754.2	6.5	0.98
1984	2,934.7	6.6	0.99
1985	3,137.2	6.9	0.99
1986	3,343.6	6.6	0.99
1987	3,517.4	5.2	1.00
1988	3,700.3	5.2	1.013
1989	3,919.8	5.9	1.006
1990	4,159.0	6.1	0.99

Source: Japan Defense Agency

The country's generally strong economic growth in the past decade has enabled Tokyo to increase the defense budget by 5 to 8 percent annually without going much over the 1 percent GNP limit. As Table 2 indicates, weapons procurement has held a solid one-quarter-plus share of the budget, a distant second to personnel expenditures and just slightly ahead of the costs associated with maintaining both Japanese and American bases in Japan. Although the Y1.1 trillion ($7.3 billion at Y150=$1.00) earmarked for equipment purchases in the FY 1989 budget represented another in the continuing increases in weapons funding,

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Table 2: Allocation of Japan's Initial Defense Budget, FY 1985-FY 1989

Category	FY 1985	FY 1986	FY 1987	FY 1988	FY 1989
Personnel	45.1%	45.1%	43.9%	42.7%	41.2%
Supplies	54.9	54.9	65.1	57.3	58.8
Equipment Purchases	26.2	26.9	27.5	28.1	28.0
R&D	1.6	1.7	1.9	2.0	2.1
Facility Improvements	1.4	1.7	2.0	2.8	2.9
Maintenance	15.1	14.4	14.2	14.1	15.1
Base Countermeasures	9.5	9.0	9.4	9.2	9.5
Other	1.2	1.2	1.1	1.1	1.2

Source: Japan Defense Agency, Defense of Japan, 1989.

this level was still low compared to the whopping $79.7 billion the Pentagon spent in FY 1989 for hardware.

The effect of these budgetary and policy constraints has been to keep defense production as a share of Japan's total industrial output at a slim 0.6 percent (see Table 3). This low percentage suggests smaller production runs, which mean that Japan Defense Agency suppliers cannot realize economies of scale, a typical way of lowering costs in most sectors.

Table 3: Defense Production as Share of Industrial Production, FY 1979-FY 1987

Fiscal Year	Share
1979	0.39%
1980	0.36
1981	0.35
1982	0.46
1983	0.50
1984	0.48
1985	0.51
1986	0.55
1987	0.58

Source: Japan Defense Agency, Defense of Japan, 1989.

Not surprisingly, no major Japanese company is engaged solely in defense production. Unlike most Western countries, where arms manufacturers rely primarily on defense contracts to stay in business, Japan's defense industry is dominated by big, generally diversified companies that engage in weapons production on the side. The top five defense contractors (see Table 4) win an estimated 60 percent of the contracts awarded by JDA, but the military business generates a relatively small portion of their total revenues.

Table 4: Top 10 Japanese Defense Contractors, FY 1989

(in billions of yen*)

Ranking FY 1989	Ranking FY 1988	Company	Contract Awards	Change from FY 1988
1	1	Mitsubishi Heavy Industries, Ltd.	Y363.6	-0.2%
2	2	Kawasaki Heavy Industries, Ltd.	174.3	15.9
3	3	Mitsubishi Electric Corp.	111.7	10.8
4	6	NEC Corp.	71.0	-3.6
5	4	Toshiba Corp.	68.3	-18.0
6	5	Ishikawajima-Harima Heavy Industries Co., Ltd.	62.8	-18.9
7	7	Nippon Seiko K.K.	31.2	0.3
8	-	Hitachi, Ltd.	26.2	340.0
9	8	Komatsu Ltd.	23.6	0.0
10	9	Fuji Heavy Industries, Ltd.	21.6	-2.3

*The yen figures can be converted into dollars at FY 1989's average exchange rate of Y142.83.

Source: Japan Defense Agency

Keidanren (Japan Federation of Economic Organizations) recently gave several examples of the contrast between the dependence of Japanese and U.S. defense contractors on military spending. The Y83.1 billion ($647.8 million at FY 1988's average exchange rate of Y128.26=$1.00) worth of defense contracts won by the fourth-largest contractor in FY 1988, Toshiba Corp., for example, amounted to only 2.8 percent of the company's total revenues that year (see Table 5). Mitsubishi Heavy Industries, Ltd., Japan's top defense contractor, generated only 8 to 10 percent of its total revenues from defense work in the early 1980s, Keidanren estimated. While this figure had more than doubled by the end of the decade, MHI's dependence on defense contracts still was dwarfed by General Dynamics Corp.'s 68 percent, McDonnell Douglas Corp.'s 53 percent and Raytheon Co.'s 50 percent in 1989. Of Japan's top 20 arms manufacturers, only Japan Aircraft Manufacturing Co., Ltd., a parts supplier, is significantly dependent on defense contracts: military work accounted for 70 percent of the company's revenues in FY 1988 and more than 92 percent if military repair work is included.[1]

Defense Industry Players

Although a small group of firms dominates the industry -- with MHI far out front -- JDA typically will designate at least two manufacturers for most military hardware bids in an effort to foster competition.[2]

[1]Tai Ming Cheung, "A Yen for Arms," Far Eastern Economic Review, February 22, 1990, p. 58.

[2]Bruce Roscoe, Defense Revisited (S. G. Warburg Securities, Japan, Inc.: July 1988), p. 42.

Table 5: Defense Contracts as Share of Revenues in 1988 Business Year*

(in millions of dollars**)

	Contract Awards	Share of Revenues
Japanese Contractors		
Mitsubishi Heavy Industries, Ltd.	$2,840	21.3%
Kawasaki Heavy Industries, Ltd.	1,172	19.6
Mitsubishi Electric Corp.	786	4.5
Toshiba Corp.	648	2.8
Ishikawajima-Harima Heavy Industries Co., Ltd.	603	12.6
American Contractors		
McDonnell Douglas Corp.	8,000	53.1
General Dynamics Corp.	6,500	68.3
General Electric Co.	5,700	11.5
Tenneco Inc.	5,000	38.2
Raytheon Co.	4,000	49.5

*For Japanese companies FY 1988 (April 1988-March 1989); for American companies calendar 1988.
**The yen figures were converted into dollars at FY 1988's average exchange rate of Y128.26=$1.00.

Source: Keidanren

Aircraft - MHI, Kawasaki Heavy Industries, Ltd. and Fuji Heavy Industries, Ltd. dominate the aircraft sector. As will be discussed below, MHI was chosen to codevelop with General Dynamics Japan's new fighter support aircraft, FSX, which will be modeled on the U.S. firm's F-16; KHI and FHI are the main Japanese subcontractors. MHI also has been the prime contractor for the F-15J and F-4EJ fighters, both licensed from McDonnell Douglas. KHI has the lead role in manufacturing the P-3C antisubmarine surveillance aircraft, licensed from Lockheed Corp. These three aircraft are mainstays of the Air Self-Defense Force.

Under license from Bell Helicopter Textron, Inc., FHI has been the prime contractor for the AH-1S antitank helicopter. It is now making the multipurpose HU1B/H helicopter and appears to have the inside track as prime contractor for a new antitank helicopter that JDA wants to procure in the 1990s. Shin Meiwa Industry Co., Ltd., one of the world's few manufacturers of "flying boats," makes the US-1, a search and rescue amphibious vehicle used by the Maritime Self-Defense Force.

Japan Aircraft Manufacturing makes part of the fuselage for the F-15J as well as pylons and missile launchers, engine nacelles for the P-3C and other parts for helicopters. Ishikawajima-Harima Heavy Industries Co., Ltd. is Japan's top manufacturer of engines for military aircraft. In FY 1989, for example, IHI had planned to produce 26 F100s for the F-15J under license from the

Pratt & Whitney division of United Technologies Corp.; 40 T56s for the P-3C under license from the Allision division of General Motors Corp.; and 40 of the domestically developed F3s for the T-4 trainer.

Ships - Five major shipbuilders supply the Maritime Self-Defense Force: MHI, IHI, Mitsui Engineering & Shipbuilding Co., Ltd., Hitachi Zosen Corp. and Sumitomo Heavy Industries, Ltd. Defense contracts have helped to keep builders afloat given the downturn in commercial orders over the past 10 years or so (see JEI Report No. 6B, February 9, 1990). JDA's plans to acquire four new destroyers equipped with the U.S.-supplied Aegis system, a sophisticated radar and weapons system, should be a boon to shipbuilders. MHI was tapped to install the system in the first warship, but IHI may win the second contract.[3]

Tanks and Artillery - Komatsu Ltd. and MHI are the leading suppliers of tanks. In a consortium with Hitachi, Ltd. they have developed the Type-90 model, which reputedly outperforms U.S. and West German tanks in its class. As will be discussed below, the Type-90 is considered one of the Japanese defense industry's success stories; features that set it apart from Western-developed models, such as its automatic firing and loading system and armor plating that can withstand direct hits, were developed domestically.

Komatsu, along with Howa Machinery, Ltd., Nittoku Metal Industry Co., Ltd. and Japan Steel Works, Ltd., also provide ammunition. Komatsu makes turret drives for armored cars under license from General Electric Co. as well as howitzers and artillery gun barrels. JSW focuses principally on artillery, although it does some assembly of tanks and other military vehicles for MHI. Howa is an important supplier of rifles, and NMI produces machine guns for JDA.

Missiles - MHI also excels in missile production, both those developed in-house and those licensed from U.S. producers. MHI is the lead company for licensed production of Raytheon's Patriot, a high-altitude surface-to-air missile; Mitsubishi Electric Corp., NEC Corp. and Toshiba are subcontractors. MELCO, however is the prime contractor for Raytheon's low-altitude surface-to-air HAWK missile and reportedly is working with Toshiba and MHI, in cooperation with JDA, on research for a HAWK replacement. MELCO also is involved in developing the phased-array radar system that will be used in the FSX.

In addition to producing the Patriot and the HAWK, defense companies are engaged in several missile projects that rely exclusively on indigenous technology. Toshiba is the prime contractor for Keiko, a shoulder-fired, surface-to-air missile that uses a charge-coupled device to home in on targets. MHI and MELCO are contractors for the XGCS bomb guidance unit, an add-on system that converts conventional bombs into guided missiles, such as the U.S.-made Paveway. However, the XGCS uses infrared homing rather than the laser guidance found in the Paveway. MHI also is involved in projects to supply JDA with air-to-air (XAAM-3), ship-to-ship (XSSM-1B) and air-to-ship (XAXM-1C) missiles as well as an antiship, antiradar missile, ARM.

Defense Self-Reliance

Given the relatively small size of Japan's defense industry, some American policymakers have argued that it makes little economic sense for Tokyo to

[3] Ibid., p. 43.

encourage the production of military equipment that can be produced more efficiently in this country and elsewhere. The Japanese government, however, actively promotes self-reliance in arms production. Tokyo has accepted the diseconomies inherent in military work in order to build a viable defense industrial base. While JDA continues to purchase off-the-shelf some sophisticated frontline equipment from the United States, for the most part the agency favors systems produced domestically, either under license or developed indigenously (see Table 6). About 99 percent of the MSDF's warships and more than 80 percent of the aircraft, ammunition and firearms procured by the Ground Self-Defense Force come from domestic companies.[4]

Table 6: Share of Domestic Purchases in Total Procurement, FY 1979-FY 1987

Fiscal Year	Share
1979	85.2%
1980	88.5
1981	80.5
1982	88.6
1983	90.3
1984	90.7
1985	90.9
1986	90.8
1987	91.0

Source: Japan Defense Agency, Defense of Japan, 1989.

There are political, strategic and economic reasons why JDA has pursued this more expensive and time-consuming approach to procurement. Like most industrial countries, Japan does not want the security risks that come with being overly dependent on foreign sources for military equipment. The 1985 Defense White Paper urged self-sufficiency in defense production for this reason, as does the defense production committee of Keidanren.

But JDA recognizes that in some sectors Japanese companies lag significantly behind their Western counterparts. In these cases the agency has opted for and will continue to choose licensed production so that an array of domestic manufacturers -- not just prime contractors -- can acquire technological expertise they lack. Table 7 gives an indication of how many companies benefited from JDA's decision in the late 1970s to produce McDonnell Douglas' F-15 fighter under license. Similarly, the Patriot missile project, for which MHI is the prime contractor, will keep busy a range of subcontractors: FHI is providing launching gear; MELCO is responsible for radar and guidance equipment; Hitachi is in charge of power supply and data link systems; and Asahi Chemical Industry Co., Ltd. is providing the rocket motor ignition system. The U.S. government has supported these coproduction arrangements as a means of both ensuring systems interoperability between American and Japanese forces and fostering close political relations.

[4]Cheung, op. cit.

Table 7: F-15 Subsystems Contractors

Subsystem	Product	Company
Gun Mounts	AN/APG-63	Mitsubishi Heavy Industries, Ltd.
Radar Display	OD-60A	Tokyo Keiki Co., Ltd.
Data-Link Receivers	Japanese system	Hitachi, Ltd.
UHF Receivers	AN/ARC-164	Mitsubishi Electric Corp.
Instrument Displays	AN/AVQ-20	Shimadzu Corp.
Instrument Displays	Parts	NEC Corp.
Computing Gyro	CN-1377/AWG	Toshiba Corp.
Inertia Navigation	AN/ASN-109	Toshiba Corp.
Direction Finder	DA/8639/ARD	Mitsubishi Electric Corp.
IFF Device	RT-868A/APX-76	Toyo Communications Equipment Co., Ltd.
Attitude Indicator	AN/ASN-108	Tokyo Keiki Co., Ltd.
Pressure Reader	AN/ASK-6	Tokyo Keiki Co., Ltd.
Radar	Japanese system	Tokyo Keiki Co., Ltd.
20 mm Guns	M61A1	Sumitomo Heavy Industries, Ltd.

Note: Unless otherwise noted the technology for these subsystems belongs to the Department of Defense or individual American companies.

Source: Wing, July 26, 1978 as cited in "Nihon no Heiki Kojo," Satoshi Kamata, October 15, 1983.

Civilian/Military Linkage

In deciding on procurement Tokyo has emphasized licensed production of aircraft and missiles. This experience, in turn, has enabled Japanese industry to develop replacement systems using indigenous technology. For example, Toshiba's Keiko surface-to-air missile replaces the U.S.-made Stinger SAM; MHI's XAAM-3 air-to-air missile replaces another American system, the AIM-9L Sidewinder. MHI, MELCO and Toshiba are sufficiently confident with the knowledge gained through production of the HAWK that they want to develop a follow-on system for deployment in the late 1990s. Likewise, the Japanese manufacturers involved in the Patriot project anticipate considerable technological spin-offs that they expect to apply to future-generation systems.

Industry analysts maintain that the success of Japanese companies in missile development also is a testament to arms makers' skill in applying sophisticated electronics technology originally developed for commercial use to some of their defense systems. This transfer probably arose out of necessity. Government funding for defense R&D has drawn only about 2 percent of the defense budget in recent years. In FY 1988 this amounted to Y73.3 billion ($488.7 million) as compared to the $36.8 billion earmarked for R&D by the Department of Defense.

JDA's Technical Research and Development Institute, which is primarily responsible for defense research, has backed some not insignificant domestic projects, such as the portable Tan SAM (which uses both light image and infrared homing), the T-2 trainer (the first domestically developed supersonic jet

for advanced pilot training) and its T-4 successor, and the F-1 fighter support aircraft. However, industry representatives assert that, if the defense sector is to achieve self-reliance, increased government funding for research and development is imperative.

Keidanren's defense production committee has insisted that R&D spending should be increased to at least 5 percent of the defense budget; that would bring it in line with the amounts appropriated by Western industrial countries. While TRDI's budget has expanded in recent years, the current mood of fiscal restraint as well as a variety of domestic and international political factors make sizable increases unlikely in the foreseeable future.

What has facilitated the defense industry's borrowing of commercial technology is the almost complete integration of military and civilian work in most of the companies that do work for JDA. This is not the case in the United States, where tough procurement regulations often mean that American companies with both defense and civilian contracts maintain completely separate production lines, engineering teams, and bookkeeping and accounting systems. Some analysts, in fact, have pegged this lack of integration as a main cause of the problems U.S. industry is having in adapting to cutbacks in defense spending and changing market conditions (see JEI Report No. 24A, June 22, 1990).

Perhaps one result of this separation has been the increasing reliance of U.S. arms makers on Japanese commercial technologies with military applications or dual-use technologies. Some examples are Toshiba, the largest supplier of semiconductors to U.S. defense contractors, and Sumitomo Electric Industries, Ltd., which produces optical fibers that reportedly are being considered for use in a next-generation antitank missile being tested by the Army.[5] American policymakers have grown more and more concerned about this dependence, which they fear will discourage domestic manufacturers from risking investment capital. The result, they worry, could be a fizzling of U.S. competitiveness (see JEI Report No. 24A, June 24, 1988).

Conversely, the Pentagon is keenly interested in Japanese industry's ability to develop new military technologies using commercial technological advances as a springboard. At Washington's urging the two countries in 1983 exchanged diplomatic notes that, in effect, give the United States access to Japanese defense technology. After seven years the agreement has resulted in just two exchanges of Japanese-developed technology -- one to clean ship hulls and the other for drydock upkeep; naturally, the Pentagon is disappointed.

American defense planners, in pushing for joint development and production of the FSX, had hoped that this project would allow U.S. industry greater access to Japanese military technology. The November 1988 memorandum of understanding and April 1989 side letters governing the accord stipulate that any Japanese improvements to F-16 technology must flow back to the United States (such as co-cured composite wing technology), while technologies developed independently by Japanese companies would be available to American contractors for a fee. Washington specifically indicated that it wanted access to such technological advances as active phased-array radar, the inertial navigational system, electronic countermeasures and the mission (weapons control) computer hardware system (see JEI Report No. 18B, May 5, 1989).

5"Weapons Wizards," Business Tokyo, June 1990, p. 24.

When Defense Secretary Richard Cheney visited Japan in February 1990 to discuss Washington's plans to restructure American forces in Asia, he presented a list of military technologies that DOD wants Japan to transfer to the United States. These technologies, which have been under discussion for at least the past two years, include improved missile homing devices, next-generation tank armor and submarine warfare technologies (see JEI Report No. 33B, August 26, 1988). A formal agreement pledging Japan's cooperation reportedly may be signed in the near future.[6]

Aerospace Technology Grab?

The Japanese defense industry's experience in missile and tank development demonstrates its innovative capacity, particularly in the adaptation of civilian technologies. Japan's approach to aircraft development, however, has engendered concerns in some American quarters that progress in this area ultimately may hurt U.S. defense contractors as well as commercial aerospace manufacturers.

Citing the Ministry of International Trade and Industry's 1980 industry "vision," which emphasized development of Japan's commercial aircraft sector, a 1982 study by the General Accounting Office concluded that technology transfers from coproduction programs, such as those for the F-15, significantly enhanced private-sector airframe and engine production capabilities. A 1984 Defense Science Board report also underscored the Japanese government's role in supporting the development of high-technology industries, its drive to develop self-sufficiency in production of military hardware and the perceived link between commercial and defense projects. American journalists who observed MHI's MU-300 Diamond business jet being assembled next to the F-15J production line concluded -- without much technical evidence -- that the fighter aircraft's technology was making its way into a civilian plane; this, too, appeared to lend further credence to reports of commercial technology grabs.

Some analysts rebut that Japanese commercial aircraft producers never have banked on military technology transfers to improve their capabilities in the civilian area but instead have relied on partnerships with foreign manufacturers for up-to-date commercial airframe and engine technologies (see JEI Report No. 34A, September 1, 1989). However, the ups and downs of this strategy in the airframe field -- notably, Boeing Co.'s December 1987 shelving of a plan to develop an advanced-technology 150-seat plane with MHI, KHI and FHI as equity partners and the trio's decision to play a subcontractor-plus role in Boeing's 767-X project (see JEI Report No. 17B, April 27, 1990) -- apparently have increased the importance of any commercial spin-offs Japan can obtain from defense joint ventures like the FSX.

That was precisely the issue U.S. legislators seized during the spring of 1989 when, using their authority to review export license applications (for the transfer of General Dynamics' F-16 technology), they nearly killed the FSX deal (see JEI Report No. 21A, May 26, 1989). Pentagon proponents of the FSX project insisted that fighter airframe technology cannot be applied readily to the production of commercial transports. Moreover, the key flight control technology, which indeed would have commercial applicability, would not be transferred to prime contractor MHI, they pointed out.

[6]Ibid., p. 25.

The extent to which General Dynamics' technology makes its way into Japanese commercial aircraft will be seen in time. Judging by the intercompany wrangling that further delayed the start of the project until this spring, this could come much later rather than sooner. The development phase of the project was held up by the inability of MHI and General Dynamics to agree on implementation arrangements. After nearly 10 months of negotiations the two industry giants concluded a contract in late February 1990 governing joint development and production of the new fighter (see JEI Report No. 9B, March 2, 1990).

Representatives from MHI and General Dynamics now are grappling with design questions at MHI's Nagoya Aircraft Works. DOD's official word is that the FSX is on track. Industry sources maintain, however, that the dimensions of the project have been grossly underestimated. Reams and reams of data must be analyzed to determine whether the FSX design is operationally sound, a somewhat daunting task. Concerns also have been voiced that questions about the flowback of Japanese technology again will rear up as work on the prototype begins. In addition, MHI's choice of an engine for the aircraft can be expected to reactivate debate in Congress and in certain executive branch agencies concerning technology transfer safeguards.

Delays and unanticipated costs recently prompted MHI to ask JDA to budget an additional Y500 million ($3.3 million) on top of the original Y165 billion ($1.1 billion) allocated for FSX design and development. The request stems from inaccurate airframe design and development cost projections as well as MHI's decision to develop independently the source codes for the mission control computer. The latter decision alone drives expenses up Y100 million ($667,000).

MHI also has asked JDA to extend the deadline for the start of FSX production one more year. Assembly of the first prototype was to begin in 1991, and its demonstration flight was set for 1993. The flight test program was supposed to be finished by 1996, with the first aircraft coming off the assembly line in the fall of 1997. Now, however, delays may prevent the Air Self-Defense Force from receiving its first FSX until 1998.

Some Japanese defense analysts are concerned that the new fighter aircraft may fall victim to the budget ax if Tokyo decides that its 1991-95 defense plan should be scaled back to reflect changes in the international order. While spending cuts are possible, at this stage funding for FSX design and development work is expected to continue at least through March 1992.

Planning for the New World Order

The attention of Japan's defense industry is riveted to negotiations for the next five-year defense plan. The extent of the industry's growth and greater self-reliance will be determined in part by these talks. The government's National Security Council, which met in mid-June and again in early July to discuss the 1991-95 plan, has urged Tokyo to continue modernizing its armed forces despite political, economic and security changes in the Eastern bloc and improvements in U.S.-Soviet relations. "It is necessary to see through the consequence of the current historical changing of world situations," the NSC report stated. Arms control is not yet progressing similarly in the Asian region, and regional instability is possible, defense officials add.

JDA wants the new medium-term plan to include funds for several advanced systems in addition to the FSX. For the most part these would be purchased off-the-shelf from the United States. They include: AWACS (airborne warning and control system) aircraft, the multiple-launch rocket system, tanker refueling aircraft and Aegis systems. JDA also is lobbying for money to establish a headquarters for intelligence gathering and analysis with a staff of 2,000. General improvements in living and working conditions for SDF members would bring the total requested for the next five-year plan to Y2.3 trillion ($15.3 billion) as compared to the Y1.8 trillion-plus ($12.3 billion) budgeted for the 1986-90 plan. (Not anticipated are boosts in funding for studies related to the Strategic Defense Initiative, which also is being challenged in Congress in light of changing security needs and U.S. fiscal problems.)

Pentagon sources maintain that Washington generally is satisfied that the 1991-95 plan as now envisioned will assure continued improvements in Japan's self-defense capabilities. However, domestic critics are severe. The opposition parties have argued that the plan should be reevaluated with an eye toward reducing Japan's military power in accordance with the easing of world tensions. They, along with certain members of the ruling Liberal Democratic Party, have suggested that the program encompass only three years to allow the government greater flexibility in adapting Japan's defense effort to improvements in East-West relations.

Industry observers will not be held in suspense much longer. JDA must submit its budget proposal for FY 1991, the first year of the plan, to the Ministry of Finance by the end of August, at which time the elements of the five-year plan no doubt also will be made known. Judging by a late July meeting between Finance Minister Ryutaro Hashimoto and JDA director general Yozo Ishikawa, however, the outlook for beefed-up expenditures is not too promising. The two officials agreed that the growth in the defense budget for the April 1991-March 1992 period should be held at 5.8 percent; JDA had been pushing for a 6.3 percent increase, citing the yen's weakening against the dollar, which has pushed up the purchase price of American-made equipment (see JEI Report No. 30B, August 3, 1990).

This limitation probably will cause delays in FY 1991 procurement of big-ticket U.S. systems, such as the MLRS and AWACS, although Tokyo might support allocation of monies for this hardware during the FY 1992 or FY 1993 periods.[7] Suffice it to say, industry observers anticipate intense interministerial bargaining and pressure from Japanese defense contractors; that may change policymakers' sentiments before they formally submit the plan later this month. (Note: A forthcoming JEI Report will present a more comprehensive treatment of the 1991-95 plan and the international and domestic factors that influenced its development.)

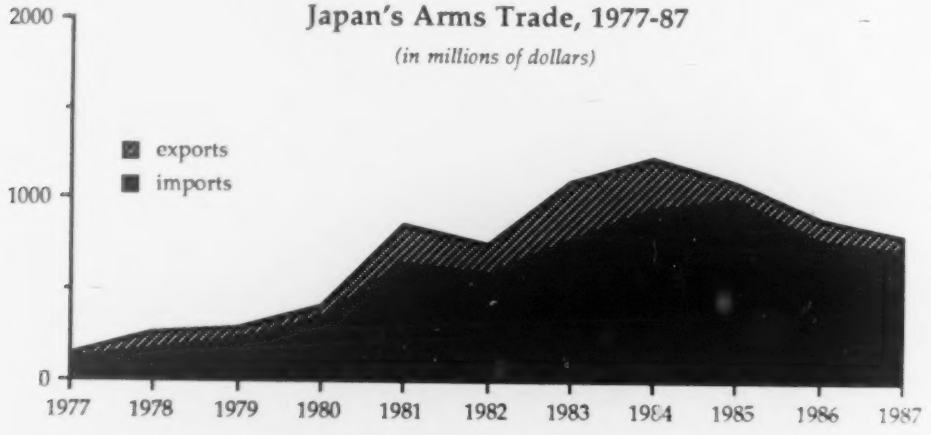
Industry Outlook: Arms Merchant?

With Tokyo's defense budget now ranked third behind the two superpowers, some Western commentators speculate that in the not-too-distant future Japan will achieve defense self-reliance and may even become a global arms merchant. This is an unlikely scenario for several reasons. To say Japan is the third-

[7] Aerospace Japan Weekly, July 9, 1990, p. 2.

largest military spender -- in dollar terms -- presents a misleading picture because of the steep appreciation of the yen in the 1985-88 period. More important, Tokyo's defense spending will continue to be hamstrung by general budgeting problems as well as domestic and international sensitivities to fears of a revival of Japanese militarism. These constraints will limit the size of Japan's defense market for the foreseeable future.

Equally important, before Japan could enter the global arms market it would have to lift its ban on the export of military hardware. Some analysts maintain that Japanese industry already has found ways to get around the export ban. Figures compiled by the U.S. Arms Control and Disarmament Agency would appear to substantiate these claims (see Figure). Certainly the proliferation of dual-use technologies and the blurred lines between military and nonmilitary equipment applications have complicated MITI's efforts to regulate the arms trade (see JEI Report No. 7A, February 20, 1987).



Source: U.S. Arms Control and Disarmament Agency,
World Military Expenditures and Arms Transfers, 1988

Most industry experts concur that in the foreseeable future Tokyo will not lift the export ban on military hardware. To do so would create more problems than opportunities. The global defense market already suffers from overcapacity. Japanese industry's entrance into this market during a time of defense spending cuts in the United States and in many European countries would precipitate ferocious competition for third-country sales. This, in turn, would exacerbate already tense economic relations between Japan and its Western allies. In fact, there is a view that Tokyo would lift the export ban only under a radical change in its approach to foreign relations in general and U.S.-Japan relations in particular.

Experts agree, however, that while the defense business of MHI, KHI and their brethren probably never will approximate that of General Dynamics, Japanese producers of a variety of dual-use products could give their American competitors a run for their money during the coming decade. Japanese manufacturers of fiber optics, avionics systems and other leading-edge technologies could build up substantial defense-related businesses without violating the weapons export embargo.

A third important point concerning Japanese industry's potential for self-reliance deals with technological gaps and product quality. Although Japan's defense contractors in the past decade have made important strides in developing indigenous technology -- as demonstrated by their missile and tank programs -- the industry still is far from producing frontline systems that can match those of the United States or the Soviet Union. In radar technology, for example, it has been estimated that leading Japanese companies, such as MELCO, still lag 10 to 15 years behind the United States. Similarly, Japanese arms makers have nowhere near the technology and applications knowledge necessary to replicate an AWAC system.

There also have been instances where indigenous weapons systems have failed to meet JDA specifications. Orders for MELCO's AEWX antiaircraft propelled vehicle reportedly were cut from 130 to 30 when it was found that the system was too slow in engaging targets. The forerunner of Toshiba's Keiko surface-to-air missile also was plagued with operational difficulties; since the CCD depends on light to stalk enemy aircraft it could not be used at night or in inclement weather unless mounted on a Stinger-style infrared guidance system. Analysts blame these shortcomings on lack of competitiveness within the industry.

By the same token the tremendous strides that Japanese defense makers have made in developing military technologies cannot and should not be dismissed. This no doubt motivated the Pentagon to approach Tokyo concerning joint research and transfers of military technologies. Qualitative improvements to both locally designed and licensed systems will continue.

Rather than an export drive in the making, industry analysts foresee a flattening of growth in the defense sector. Budgetary constraints are one reason. Although military spending is difficult to project at this stage, the pending five-year defense plan may call for spending increases in the 4 to 5 percent range compared to the nearly 6 percent growth rate enjoyed during most of the 1986-90 program.

In addition, most of JDA's goals for hardware procurement either have been met or are in the process of being met. Future needs will be satisfied through improving existing systems. Upgrades of the F-15J, for example, will involve incorporation of Japanese-made electronic and other components. This will be a boon to smaller subcontractors, while the primes may have little more to do than "plug in the parts." Thus, not only will industry growth slacken but there could be some reshuffling of the players.

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The views expressed in this report are those of the author and do not necessarily represent those of the Japan Economic Institute.